Garrard

ZERO 100 C

Instruction Manual

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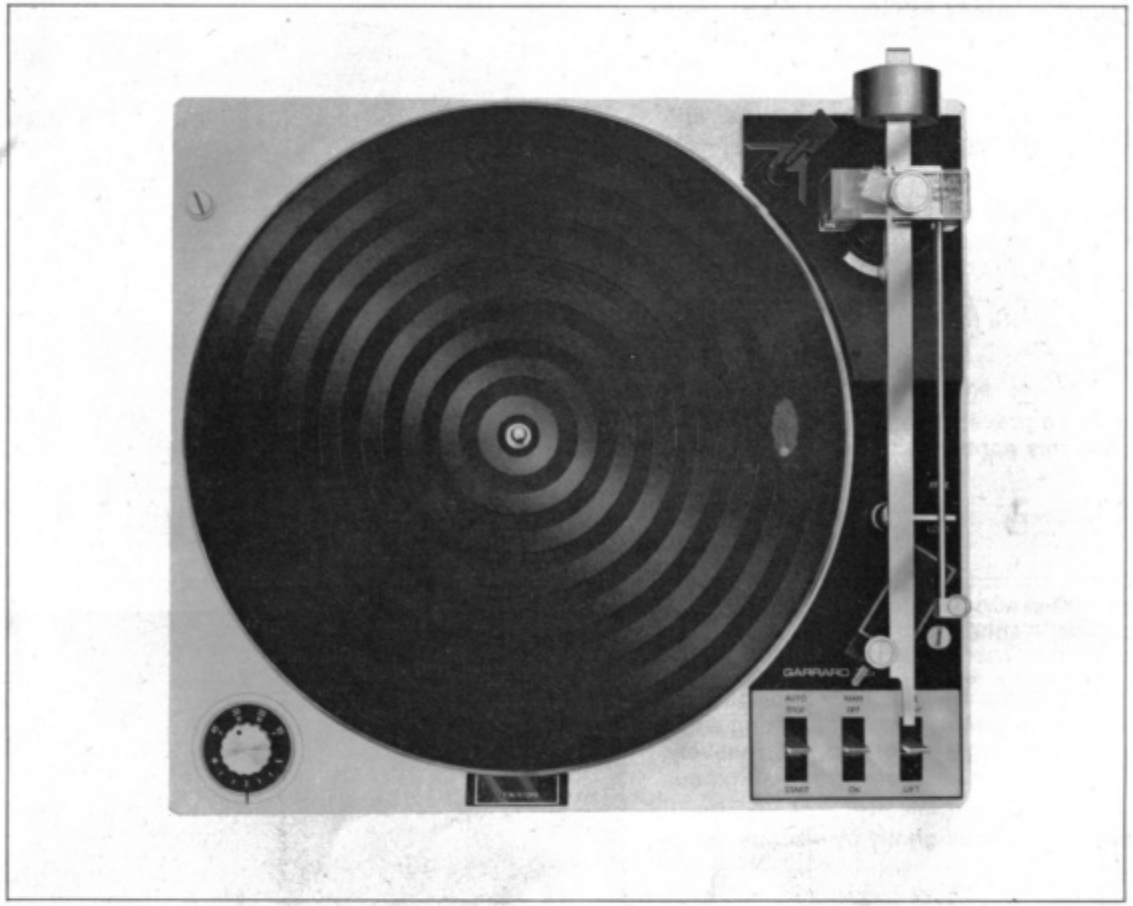

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Garrard

ZERO 100C

AUTOMATIC TRANSCRIPTION TURNTABLE

Garrard Engineering Limited Newcastle Street Swindon Wiltshire England

INTRODUCTION

The Garrard Zero 100c is a superb two-speed transcription turntable with such special features as

* an ingenious tonearm virtually without tracking error (Patent applied for) with damped cueing action.
* An automatic record counter. This new feature (Patent applied for) indicates when a diamond-tipped stylus should be checked for wear, based on the number of L.P. records played.
* a magnetic tonearm anti-skating system (Patent applied for).
* a motor with the advantages of both induction and synchronous motors (Patented).
* a record speed and pitch control system with built in stroboscopic checking.
* a tilting device to set the cartridge tracking angle.

In addition to manual operation the Zero 100c will automatically play single 7in (17cm), 10in (25cm) and 12in (30cm) records, or a stack of up to six 12in records – the number will depend upon the thickness of the records. Adaptors are available to play records with large centre holes and to play a stack of 7in records.

Naturally, you will be keen to put your turntable into use as soon as possible but, as you realise, it is a precision instrument. For this reason, we strongly advise you to read the instructions before installing or operating it so that you will obtain the full benefit of its many capabilities.

WARNING: To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

BRIEF TECHNICAL SPECIFICATION

Power Supply Voltage: 110/125V AC or 110/120 and 220/240V AC dependent on the motor coil windings. Power supply requirements are shown on the motor.

Power Supply Frequency: 50 or 60Hz dependent on the interchangeable motor pulley and stroboscopic turntable fitted.

Power Consumption: Approximately 9 watts.

Speeds: 33⅓ and 45 rev/min. Both speeds can be varied by plus or minus 3%. Accuracy of speed is checked by means of an illuminated stroboscope.

Motor: A 4-pole induction rotor section to provide the starting torque and a synchronous section for constant running speed. It is resiliently mounted.

Tonearm (Pickup Arm): The tonearm head pivots laterally as it tracks a record to maintain negligible tracking error. The magnetic tonearm anti-skating system is calibrated for both conical (spherical) and elliptical cartridge styli.

A tilting arrangement allows the cartridge to be set in position to give the correct tracking angle when playing a single record or, alternatively, at the height of three records for automatic play.

It is lifted and lowered gently by viscous damping.

Size: Approximately 14¾in (375mm) wide, 13¼in (335mm) deep and 6¾in (170mm) high.

Weight: Approximately 11½lb (5.2kg).

OPTIONAL EXTRAS

* **A mounting base and** dust cover.
* **A record spindle adaptor Type** LRS100 to **play up** to six records **with** 1½in (38mm) **centre** holes automatically.
* A record platform adaptor Type A6 to play up to six 7in diameter records with small centre holes automatically.

The carton contains the following accessories in addition to the Zero 100c with its platter.

1 **A short record spindle for playing single records**
This is fitted by locating it in the centre of the platter and pressing it down into place. It turns with the record to minimise wear.

2 **A long record spindle for playing a stack of records automatically**
This is fitted by locating it in the centre of the platter and turning the spindle until it can be pressed down to be held in place by a retaining clip. The spindle can be removed again by a straight upward pull.

3 **A large centre hole record adaptor**
This fits over the single record spindle to enable records with 1½in (38mm) diameter centre holes to be played singly.

4 **A kit of cartridge fixing parts**
This comprises a range of screws of different lengths, and a clear plastic setting gauge for checking the alignment of the cartridge in the tonearm.

5 **A tonearm counterbalance weight**
See below.

6 **(Not shown) A rubber mat**
Place the mat concentrically on the platter. Press the central area of the mat gently downwards until the circular ribs underneath it engage the recesses on top of the platter. The mat will then slope downwards slightly towards the middle, so that the record is supported at the maximum radius.

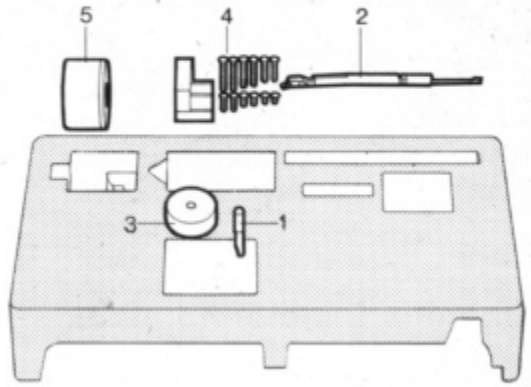


Diagram 1 Accessories in Packing Piece

THE TONEARM COUNTERBALANCE WEIGHT
Screw this on to the rear extension of the tonearm, rounded corner first, to secure it until the stylus force is set.

The counterbalance weight must be assembled and taken off the tonearm only by a screwing action.

Any other method of assembly, such as direct push or pull, may cause permanent deformation of the isolation member in the weight and result in rumble being heard through the speakers.

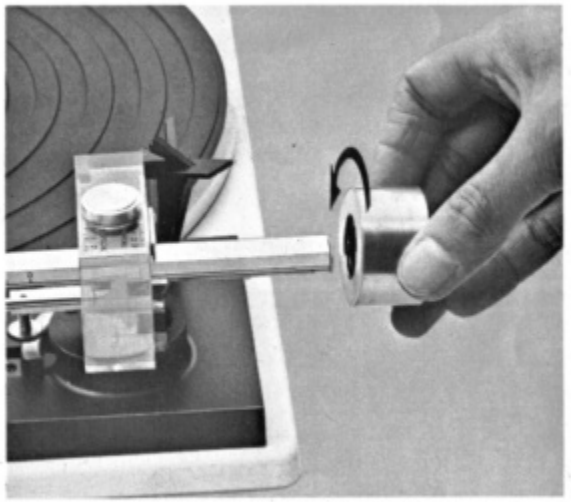


Diagram 2 Fitting Tonearm Counterbalance Weight

INSTALLATION

If the mounting board of the cabinet or base is already prepared for use, disregard section 1 below.

1 Prepare the mounting board in accordance with the instructions on the template.

2 Check that all four damping pads are firmly in place in the mounting springs. Turn both transit screws fully clockwise and transit clips vertical.

3 Thread power supply, ground and phono leads through the cut-out in the mounting board. Make sure that all leads are clear of any moving parts under the unit plate, particularly in the area underneath the tonearm.

4 Place the unit in position on the mounting board, aligning both transit screws with their holes and locating all mounting springs in their recesses. See diagram 3.

5 Press the unit down on its springs, then turn both transit clips to the horizontal playing position. Release the unit.

6 Carry out the cabling instructions on page 5.

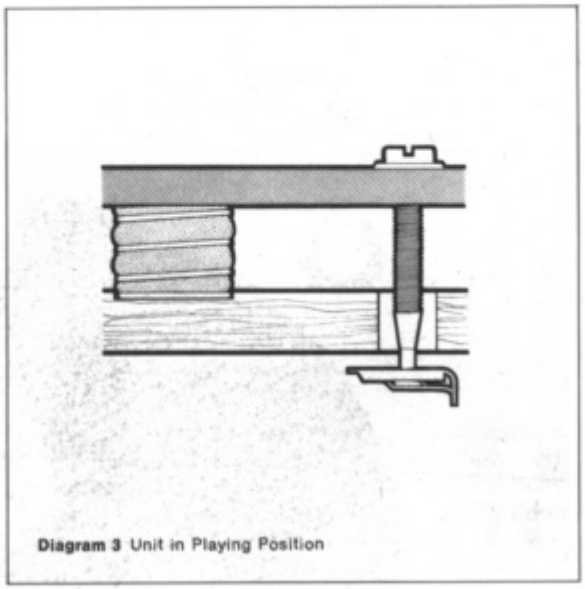


Diagram 3 Unit in Playing Position

PREPARING THE UNIT FOR TRANSIT IN ITS CABINET OR BASE

1 Lock the tonearm to its rest and fit the stylus guard.

2 Ensure that the tonearm counterbalance weight is securely fitted so that it cannot be dislodged by possible vibration in transit.

3 Ensure that the platter is securely held by its retaining clip. Remove the rubber mat and store it separately.

4 Press the unit down on its mounting springs and turn both transit clips fully counterclockwise to brace it against the mounting board. See diagram 4.

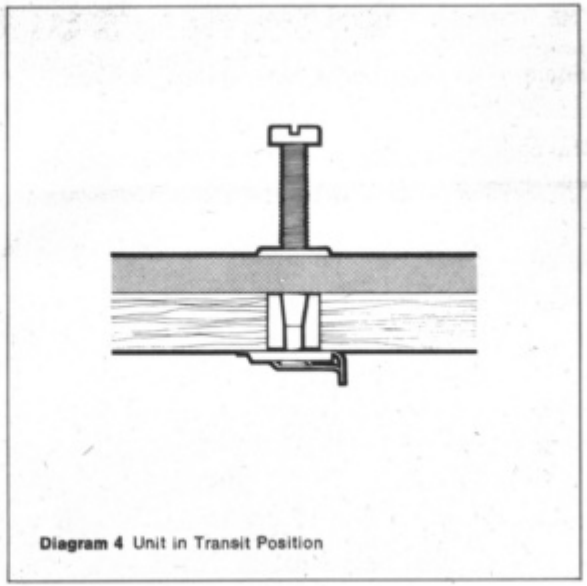


Diagram 4 Unit in Transit Position

CABLING INSTRUCTIONS
Your Garrard Zero 100c turntable can be used with either mono or stereo sound systems as described below.
Note: R.C.A. type output connectors are used on this turntable.

A.C. POWER SUPPLY AND GROUND CONNECTIONS
The brown AC power supply cable should be plugged into the power outlet on the amplifier or, if this is not provided, into a wall socket. The green (or green and yellow) ground lead should be connected to a ground connection on the amplifier chassis or directly to ground. The amplifier manufacturer's instructions will give more detailed advice.

A.C. Power and Ground Connections

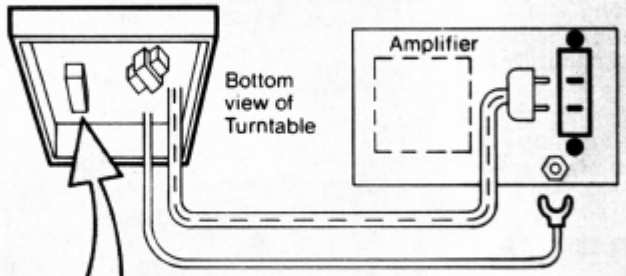


Diagram 5

CONNECTING A STEREO CARTRIDGE TO A STEREO AMPLIFIER
Plug both phono leads into the amplifier input sockets as shown in diagram 6. Make certain that the right-hand pickup output channel (R) is connected to the amplifier input feeding the right-hand speaker and that the left-hand output channel (L) is connected to the input feeding the left-hand speaker.

Stereo Cartridge – Stereo Amp Connections

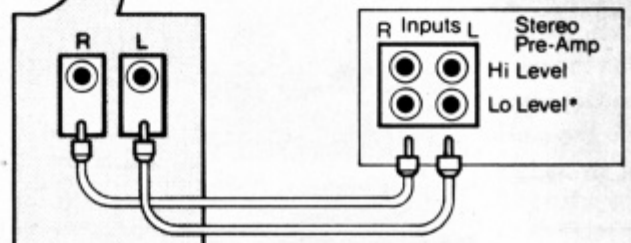


Diagram 6

CONNECTING A MONO CARTRIDGE TO A STEREO AMPLIFIER
Plug in the phono lead as shown on diagram 7. Use the right-hand pickup output channel (R) if the red and green leads in the tone-arm cartridge carrier are connected to the cartridge output pins and the left-hand output channel (L) if the white and blue leads are connected to the cartridge. Use the 'Y' adaptor only if the amplifier has no provision for connecting both input channels together in parallel.

Mono Cartridge – Stereo Amp Connections

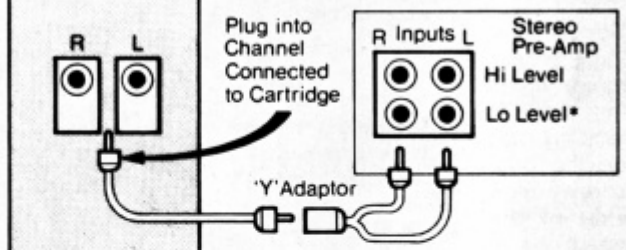


Diagram 7

CONNECTING A STEREO CARTRIDGE TO A MONO AMPLIFIER
Plug both phono leads into a 'Y' adaptor as shown in diagram 8, so that the complete output signal from the cartridge will be reproduced through the sound system.
* Refer to the amplifier manufacturer's instructions for the selection of amplifier input level for the type of cartridge in use.

Stereo Cartridge – Mono Amp Connections

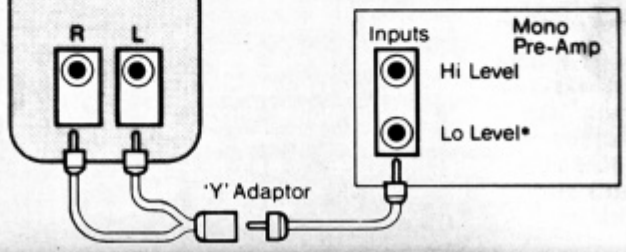


Diagram 8

FITTING THE PICKUP CARTRIDGE

The fixing screws and cartridge setting gauge provided enable a wide range of high quality cartridges to be fitted in their correct operating position in the carrier.

Great care must be taken when fitting the cartridge since it forms an integral part of the extremely precise tonearm design essential to the exceptional degree of tracking accuracy.

To fit the cartridge proceed as described below.

1 Remove the pickup cartridge carrier.
2 Attach the cartridge to the carrier.
3 Align the cartridge.
4 Connect leads to the cartridge.
5 Refit the carrier.
6 Set stylus force and anti-skating device.

1 REMOVING THE PICKUP CARTRIDGE CARRIER

Support the tonearm elevated over the platter with one hand to avoid strain and withdraw the carrier with the other hand. Turn the carrier over and peel off any adhesive tape used to hold the coloured leads during transit.

When removing the carrier with a cartridge fitted, support the tonearm well clear of the operating controls to avoid risk of damage to the cartridge.

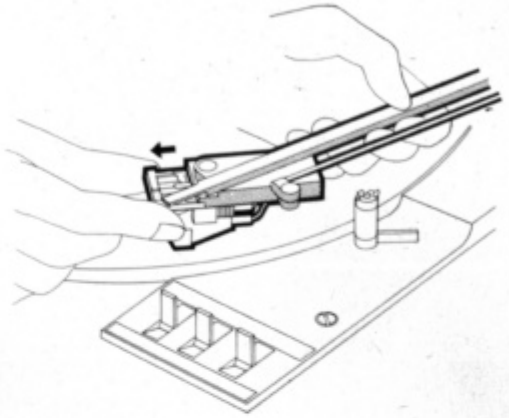


Diagram 9 Removing the Carrier

2 ATTACHING THE CARTRIDGE TO THE CARRIER

(a) Secure the cartridge to the carrier by passing a pair of screws through the cartridge mounting (see 'Note' below), then screwing them into the threaded holes in the locking plate which slides in the channel on the opposite side of the carrier. The screws must not protrude through the far side of the locking plate sufficiently to touch the setting gauge.

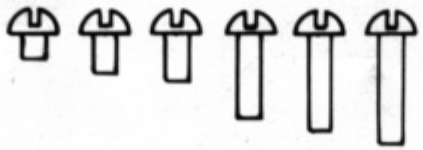
(b) Tighten the screws just sufficiently to hold the cartridge in place.

Note: The charts alongside show the fixing screws recommended for a typical range of magnetic cartridges and the actual lengths of the screws for identification. These screws have British Association No. 6 (6 BA) threads and are supplied in a set of six pairs of the lengths shown.

Recommended Screw Length

CARTRIDGE (inches)	1/8	3/16	1/4	7/16	1/2	9/16
ADC (All Models)				X		
Decca (London)			X			
Empire 90, 909, 999, and 1000		X				
Ortofon SL-15		X				
Pickering XV-15 V-15, and P Series V-15 Phase IV	X		X			
Shure V15 Type II M91E and M93E M75E, M44E, and M55E	X				X	X

1/8" 3/16" 1/4" 7/16" 1/2" 9/16"



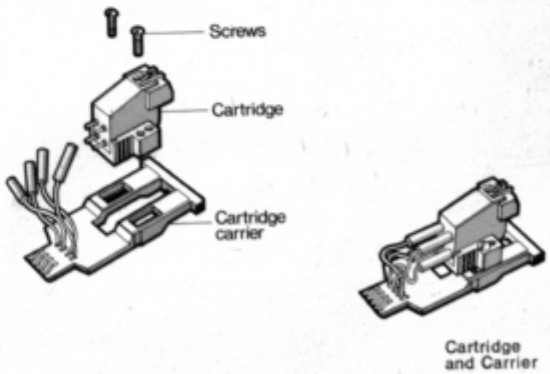


Diagram 10 Assembling the Cartridge and Carrier

3 ALIGNING THE CARTRIDGE

Slide the carrier into the slots in the clear plastic setting gauge. Take care that the stylus does not catch on the gauge as the cartridge enters.

The stylus tip must be vertically above the point at which the lines on the gauge cross. If it is not, move the cartridge until it is correctly aligned.

4 CONNECTING THE CARTRIDGE

When the alignment is satisfactory, tighten both fixing screws, remove the gauge, and connect the insulated leads on the carrier by pushing their tags onto the cartridge output pins. Use the following colour code in conjunction with the cartridge manufacturer's instructions:

Red – Right hand channel signal
Green – Right hand channel ground
White – Left hand channel signal
Blue – Left hand channel ground

Note: If a cartridge has only three pins or tags, use the green lead, or green and blue joined together. Insulate and tuck away any lead not required.

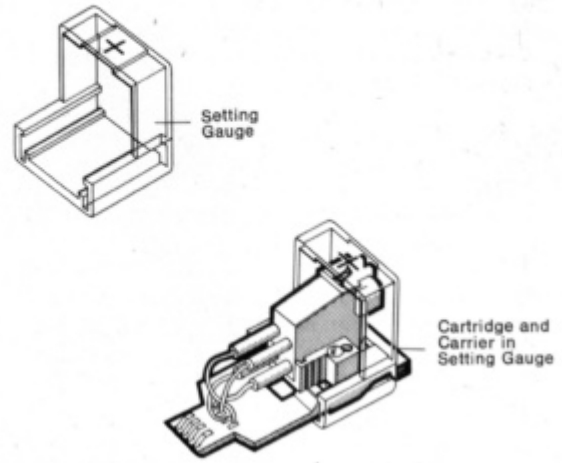


Diagram 11 Aligning the Cartridge

5 REFITTING THE CARRIER

(a) Move the tonearm locking lever to FREE, support the tonearm over the platter away from the operating controls with one hand, to avoid risk of damage to the cartridge.

(b) Locate the contact portion of the carrier into the guide slot under the rear of the head. The carrier should now be supported by the head and protrude approximately ¼in from the front of the head. Gently push the carrier into the head. It does not matter whether the cartridge tilting lever (see diagram 18) is at M or A at this stage.

6 STYLUS FORCE AND TONEARM ANTI-SKATING DEVICE

Set these as instructed in the following sections.

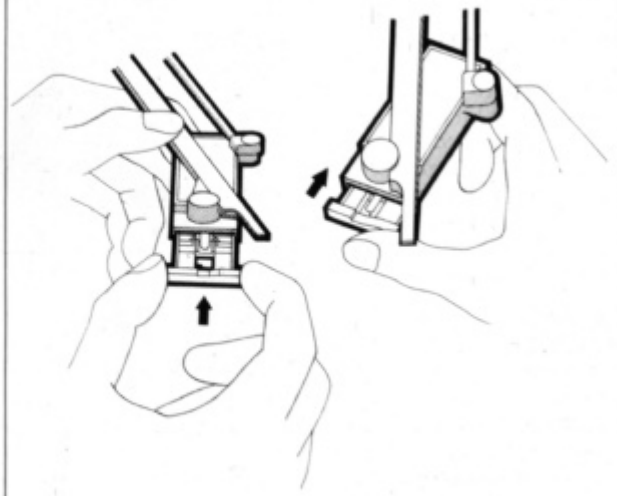


Diagram 12 Refitting the Carrier

SETTING STYLUS FORCE

1 Move the stylus force weight so that its centre line is at 0 on the tonearm and the magnetic shield (diagram 14) so that its red line is at 0 on both scales.

2 With the cartridge fitted, remove the stylus guard and move the tonearm locking lever to FREE and move the tonearm inwards so that it pivots freely. Take care to prevent the stylus from touching the rubber mat.

3 Wind the counterbalance weight backwards or forward until the tonearm is in balance with the stylus tip at the height of the top face of one record on the platter.

4 Return the tonearm to its rest, and move the locking lever to LOCK.

5 Set the stylus force to that recommended by the cartridge manufacturer by moving the stylus force weight forward until its centre line is at the mark on the tonearm scale representing this force. The scale is calibrated up to 3 grammes in steps of ¼ gramme.

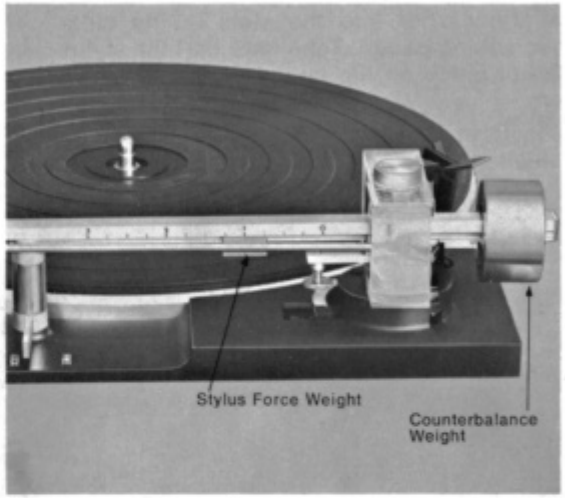


Diagram 13 Setting Stylus Force

TONEARM ANTI-SKATING DEVICE

An anti-skating control is necessary to offset the normal tendency of the tonearm to move (skate) across the record toward the centre. As the record revolves, with the arm tracking, an inward skating force is created, which must be counteracted by an equal force in the opposite direction. This minimises wear on the inner side of the groove, premature damage to the record, and sound distortion. The skating force is directly related to the stylus force set for the cartridge.

The simple but ingenious anti-skating control utilizes the well-known magnetic principle that like poles repel each other. This results in the elimination of mechanical linkage. A ceramic disc magnet is mounted on the pivoting tonearm gimbal and another affixed above it on the calibrated tonearm pivot bracket. A ferrous metal shield, slides between the two magnets, to set the anti-skating force desired. When the shield is between the total areas of the magnets, they have no effect on each other, since the shield blocks the magnetic flux. However, as the shield is moved outward, it exposes the magnetic field, creating a controllable amount of magnetic repulsion. This, in turn, exerts a measurable torsional force on the tonearm, as the two magnetic poles push apart, creating the correct amount of anti-skating force desired, as indicated on the reading scale.

SETTING THE DEVICE

1 **For a cartridge with a conical (spherical) stylus tip.** Move the magnetic shield along the transparent tonearm mounting bracket until the red calibration line on the shield is at a position on the 'conical' scale corresponding to the stylus force. If, say, 2 grammes stylus force has already been set, move the slider to the figure 2 on the scale.

2 **For a cartridge with an elliptical stylus tip.** Proceed in the same way, but use the 'elliptical' scale on the bracket.

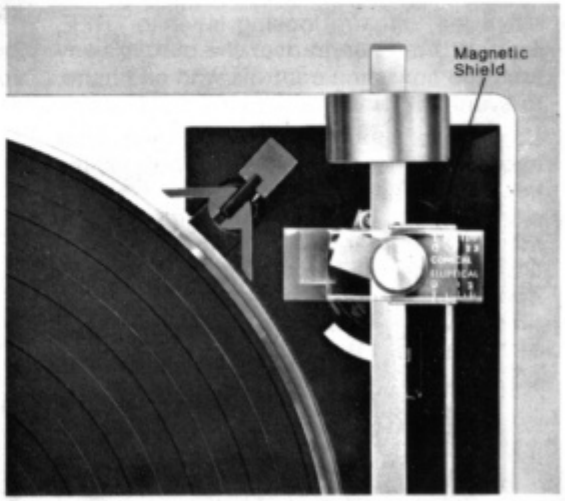


Diagram 14 Setting Tonearm Anti-skating Device

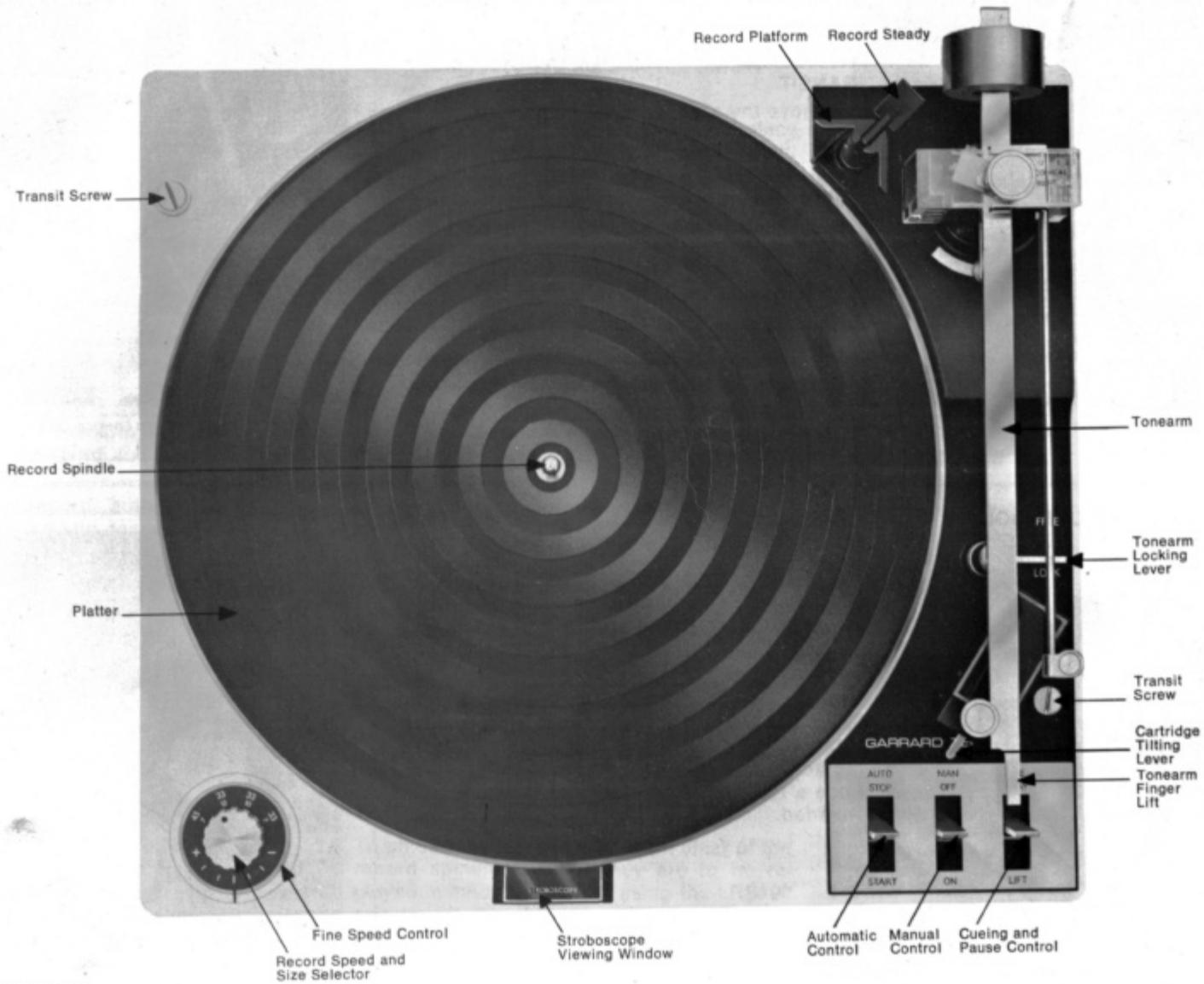


Diagram 15 Operating Features

GENERAL ADVICE

1 Keep the cartridge stylus clean and replace it when worn. Your dealer will give further advice on this.

2 Store and clean records as their manufacturers recommend. Do not leave records on the turntable for long periods after use.

3 Do not switch on unless there is at least one record on the turntable.

4 Do not hold or turn the platter counterclockwise.

5 Always allow the unit to switch itself off, or switch it off manually by one of the operating controls. If the power supply is disconnected during play, the rubber intermediate wheel will remain under pressure and may be deformed after a length of time in this condition.

6 If the cartridge has more than one stylus, make sure that the correct one is presented for the record to be played.

PREPARING THE UNIT FOR USE AFTER TRANSIT

1 Remove the stylus guard, if one is fitted.

2 Turn both transit screws fully clockwise so that the unit floats freely on its spring mountings.

3 Move the tonearm locking lever to FREE.

4 Check platter speed as described in the next section.

5 Check that all three operating tabs are upright.

6 Check automatic record counter setting. See page 12.

Reverse instructions 1, 2 and 3 before the unit is transported again.

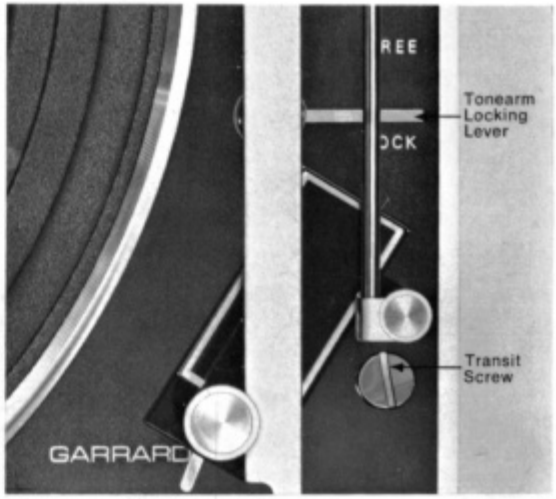


Diagram 16 Transit Screw and Locking Lever

SETTING THE FINE SPEED CONTROL

Set the black marker on the control ring to the centre of the scale; this is sufficient for most purposes. However, if an even more accurate setting is required, proceed as follows:

While playing a record as described overleaf, look at the markings seen through the stroboscopic viewing window at the front of the unit. When playing at the '33' setting, the row of black and red bars further from the platter will appear stationary when speed is exactly 33⅓ rev/min. Similarly, at the '45' setting the row of bars nearer the platter will appear stationary at exactly 45 rev/min.

If the appropriate row of bars appears to move clockwise, move the fine speed control towards the minus sign (−) until the bars appear to stop. If it appears to move counterclockwise, move the control towards the plus sign (+) until the bars appear to stop. The stroboscopic method of measurement is extremely precise.

The degree of control (approximately 3% above and below nominal speed) also enables a user with the faculty of 'absolute pitch' to set record speed to his complete satisfaction, since a total variation of almost a semi-tone is provided.

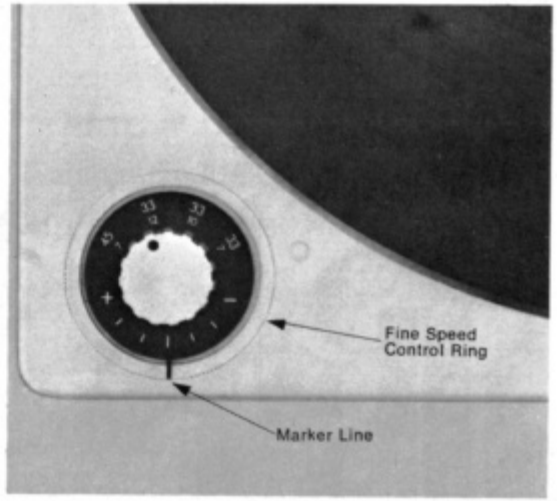


Diagram 17

INSTRUCTIONS FOR USE

To play a single record manually

1 Fit the short, single record spindle into the centre of the platter and press it down into place.

2 Place a record on the platter, using the adaptor provided if the record has a large centre hole.

3 Set the record speed selector to 33⅓ or 45 rev/min as required by the record to be played, and the cartridge tilting lever to M.

4 Move the manual operating control tab fully to ON.

5 (a) Lower the tonearm onto the record by hand lifting it at the front of the arm – or –

(b) Move the cueing control tab to LIFT, then place the tonearm over any desired point on the record and return the control tab towards PLAY to lower the tonearm gently.

After playing the record the tonearm will return to its rest and the unit will switch off.

To play a single record automatically

1 Fit the short, single record spindle and place the record on the platter, using the adaptor provided if the record has a large centre hole.

2 Set the record speed and size selector for the record to be played. For example, 33 12 for a 33⅓ rev/min 12in record.

3 Set the cartridge tilting lever to M.

4 Move the automatic operating control fully to START and hold it there for a second or two before releasing it. After playing the record the tonearm will return to its rest and the unit will switch off.

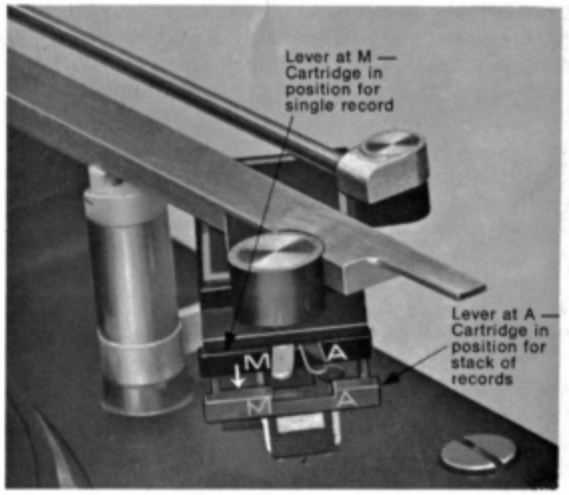


Diagram 18 Cartridge Tilting Lever

To play a stack of records automatically

1 Fit the long automatic record spindle into the centre of the platter and turn the spindle until it can be pressed down to be held in place.

2 (a) **12in records** – load up to six records on to the step of the spindle with the edge of the stack resting on the record platform. Pull the record steady upwards then inwards and release it to return to the top of the records to stabilise them.

(b) **7in records with large centre holes.** Place the LRS100 large record spindle (available from your dealer as an optional extra) over the automatic record spindle and load a stack of up to seven 7in records level onto its step.

(c) **7in records with small centre holes.** Use the Garrard type A6 record platform adaptor (available from your dealer as an optional extra complete with instructions for use).

3 Set the record speed and size selector for the records to be played. For example, set 33 12 for 33⅓ rev/min 12in records.

4 Set the cartridge tilting lever to A.

5 Move the automatic operating control tab fully to START and hold it there for a second or two before releasing it. When the records have all been played the tonearm will return to its rest and the unit will switch off.

6 To unload the records – lift them clear of the record spindle, even if they are to be replayed immediately. When using the LRS100 spindle lift the records with the fingers of both hands while pressing down on the top of the spindle with the thumbs.

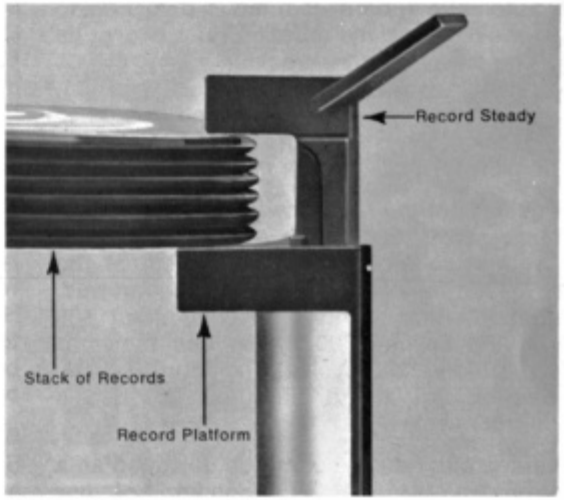


Diagram 19 12in Records on Platform

ADDITIONAL USES OF THE CONTROLS

Cue and Pause

The tonearm can be raised while a record is playing by using the cue control tab to LIFT, and lowered again by moving it back to PLAY.

This feature is particularly useful for repeating or passing over any passage of music, and to interrupt play (pause) for a short time without switching off.

Repeat

A single record being played automatically, or the last record of a stack, can be replayed by moving the automatic control tab to START before the tonearm lifts at the end of the record.

Reject

Any record of a stack (except the last), can be rejected by moving the automatic control tab to START. To reject a single record or the last of a stack move the tab to STOP.

Stop

While playing a single record, or the last record of a stack, moving the automatic control tab to STOP will return the tonearm to its rest and switch off.

While playing a stack of records this will cause the next record to be lowered before switching off.

To lower the next record and play it, move the control tab to START.

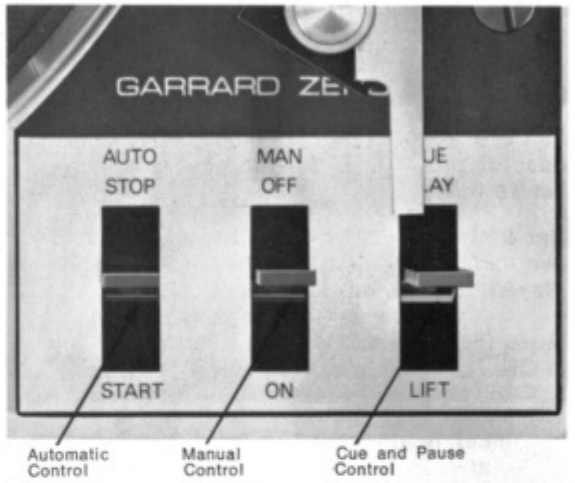


Diagram 20 Controls

AUTOMATIC RECORD COUNTER

The automatic record counter is designed to register every time the tonearm returns over its rest. The tonearm, after tracking freely, moves the ratchet wheel, shown in diagram 21, through a small arc causing the red pointer to move a small amount up the scale on the face of the gimbal surround.

The gearing of the ratchet wheel is such that it will take some 1600 cycles of the tonearm for the pointer to move from the bottom of the scale to the top. The scale itself is quartered, so that the first mark represents about 400 cycles, the second 800 cycles and the third approximately 1200 cycles. The fourth is subdivided by red marks, each representing a further 100 cycles.

The automatic record counter is designed as a useful reminder to check the condition of your stylus. It is not designed to indicate when the stylus should be changed.

Stylus wear depends on various factors, such as stylus force, stylus material (diamond or sapphire) and compliance, condition of records and, of course, whether the cycles indicated by this counter represents play of L.P. records or not. Another consideration is the generally faster rate of wear if an elliptical stylus tip is used.

To use the automatic record counter effectively, set the pointer to the lowest calibration line when starting out with a new stylus, also when the pointer reaches the top of its scale. Having set the pointer, the counter can be used to monitor the number of tonearm cycles, and based on this, periodic checks on the condition of the stylus may be made.

SETTING THE COUNTER TO ZERO

Support the tonearm over the platter to disengage the ratchet wheel and turn the wheel counterclockwise until pointer and line coincide (see diagram 21). Return the tonearm to its rest.

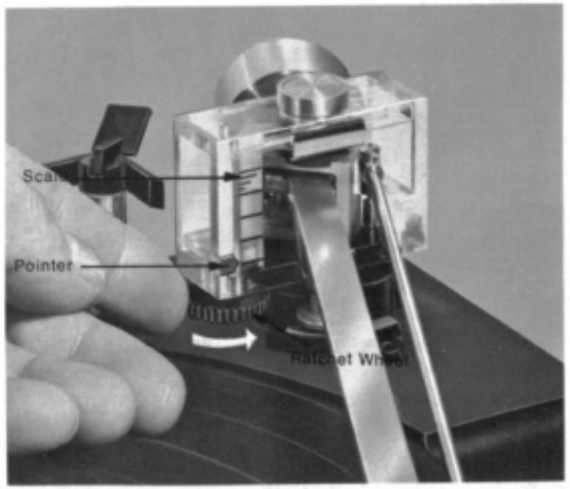


Diagram 21 Automatic Record Counter

LUBRICATION

The bearings of the intermediate wheel, motor and platter are of oil-retaining material and rarely require lubrication. However, when the need is apparent, remove the platter and apply a light oil, of the type used on sewing machines, to the points mentioned below.

TO REMOVE THE PLATTER

Pull out the record spindle, carefully lever up the inside edge of the rubber mat and prise out the plastic centre disc with a small screwdriver. With the same tool, pull off the wire retaining clip (noting its position for re-assembly) and lift off the platter by applying equal pressure on opposite sides.

Caution: Do not switch on when the platter has been removed and the speed control is set at 45 rev/min.

When refitting the platter, turn it clockwise for one revolution as soon as it is on the spindle in order to ease the rubber intermediate wheel back into its proper place.

INTERMEDIATE WHEEL BEARING

Remove the spring clip, plastic washer, intermediate wheel and fibre washer to clean the spindle and bearing before applying a thin smear of oil to their running surfaces and reassembling in reverse order. Make sure that the wheel is pulled freely against the motor pulley when the manual operating control is moved to ON and that it is fully released again when the control is moved to OFF.

Oil must not come into contact with the rubber surface of the wheel.

MOTOR BEARING

Run a drop or two of oil down a long sewing needle (or similar object) onto the motor spindle below the pulley so that it will flow into the top bearing of the motor. This bearing is out of sight below the motor mounting plate. Oil must not come into contact with the motor pulley.

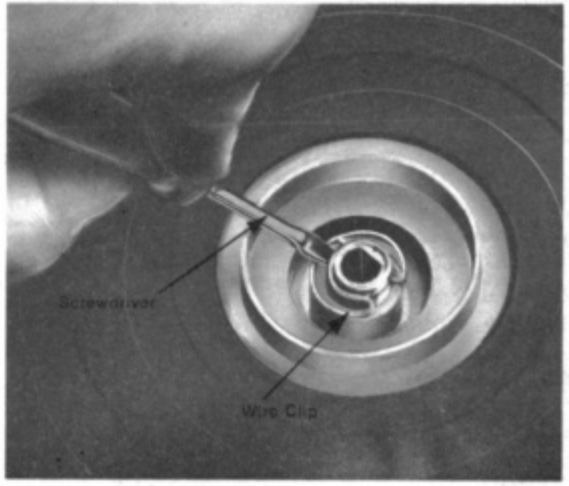


Diagram 22 Removing Platter Retaining Clip

PLATTER BEARING

Apply a thin smear of oil to the inside surface of the platter bearing. Oil must not come into contact with the driving rim.

PLATTER SPINDLE BEARINGS

Apply a thin smear of oil to the spindle and a drop or two of oil to the ball race.

CLEANING

Cartridge Stylus

Keep the cartridge clean by periodically removing its carrier (see page 6) and blowing any accumulated dust off the stylus tip or by gently brushing it away with a very soft brush.

Platter Mat

Clean this with a soft brush when necessary.

Platter Drive Mechanism

After a long period of use it may be found worthwhile to wipe the driving surfaces of the motor pulley, intermediate wheel and platter rim with a clean lint-free cloth. The stroboscopic markings can be wiped clean at the same time.

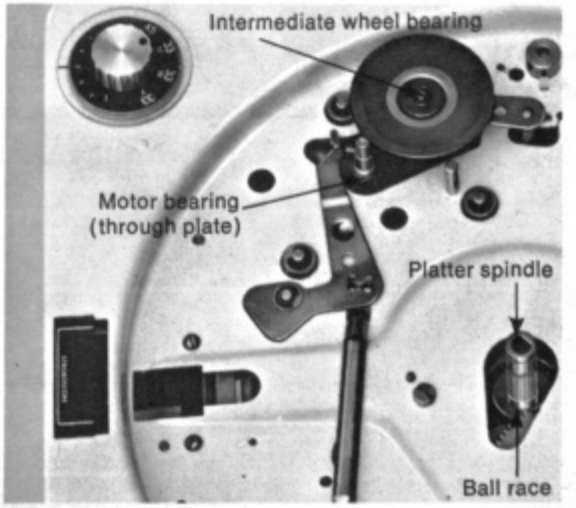


Diagram 23 Lubrication Points

Disconnect the power supply and protect the stylus before making investigations.

Service hints

Symptom	Probable cause	Remedy
Unit fails to start.	No power supply to motor.	Check that power supply is in order. Check lead connections. If necessary, clean switch blades and connections. Make certain that the plug-in motor leads are secure.
Speed consistently fast or slow after fine speed control is set.	Incorrect motor pulley.	Pulley for 60 Hertz power supply is plain brass. A 50 Hertz pulley has a groove in its base.
Speed variation (Wow or Flutter).	Warped record when playing a stack.	Play singly or stick a small square of adhesive tape on record label to improve drive.
	Grease or oil on driving surfaces.	Wipe with a clean lint-free cloth.
	Drive mechanism requires lubrication.	Lubricate in accordance with instructions (page 13).
No sound.	Incorrect or defective cabling.	Check cabling to instructions on pages 5 and 7.
	Defective pickup cartridge.	Replace cartridge.
Low humming sound.	Ground lead disconnected.	Check cabling.
Distorted sound.	Worn, damaged or incorrect stylus.	Replace stylus. Check stylus force.
	Dust on records or stylus affected by fluff.	Handle and clean records as recommended by the makers. Carefully remove any dust or fluff build-up from around the stylus.
	Cartridge out of position.	Check its position with setting gauge (page 7).
Tonearm lowers in incorrect position.	Pickup stylus out of position.	Reset or replace stylus.
	Lowering mechanism out of adjustment.	Adjust lowering position in accordance with instructions (page 15).
Tonearm lifts too high or not high enough.	Tonearm lifting height out of adjustment.	Adjust height in accordance with instructions (page 15).
Tonearm will not lower onto record at any time.	Stylus force too low.	Adjust settings of counterbalance weight and pickup stylus force in accordance with instructions (page 8).
Tonearm will not lower for automatic use after manual play.	Cue control is at 'LIFT'.	Move control back to 'PLAY'.
Tonearm will not rise from its rest.	Tonearm height restrictor out of adjustment.	Adjust according to instructions (page 15).
	Arm locked to its rest.	Move locking lever to 'FREE'.

ADJUSTMENTS

All adjustments are set during manufacture, except stylus force, and should only need to be reset in exceptional circumstances.

Setting checks will be simplified if the power supply is switched off, the automatic operating control moved fully to START and the platter rotated clockwise by hand so that the tonearm moves slowly and can be stopped in a convenient position for measurement.

TONEARM LOWERING POSITION

A minor adjustment may be necessary to make certain that the stylus tip lands inside the raised rim of the groove guard to be found on many records. While the tonearm is on its rest, use a small screwdriver to turn the adjusting screw A clockwise to move the lowering position inward and counterclockwise to move it outward.

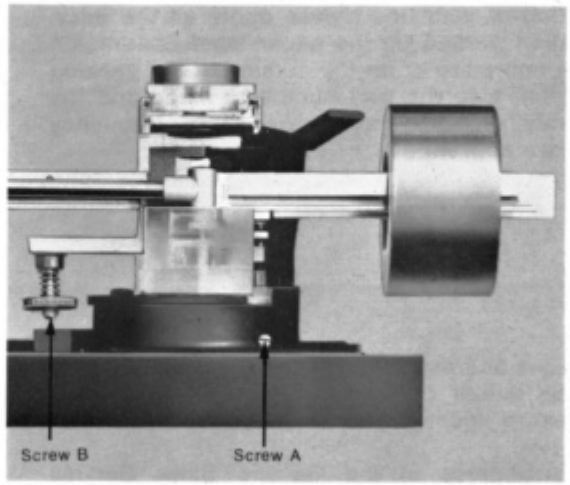


Diagram 24 Tonearm Adjusting Screws

TONEARM LIFTING HEIGHT

When the tonearm returns to its rest after rising at the end of a record, the top of the finger lift should be $1\frac{13}{64}$in (46mm) above the top face of one record on the platter.

Turn the adjusting screw B (diagram 24) clockwise to increase and counterclockwise to reduce lifting height.

TONEARM LIFTING HEIGHT RESTRICTION

The restrictor should prevent the tonearm from rising more than $\frac{1}{16}$in (1.5mm) higher than the setting referred to in the previous paragraph.

Use a small screwdriver to turn the adjusting screw C (diagram 25) clockwise to increase and counterclockwise to restrict movement.

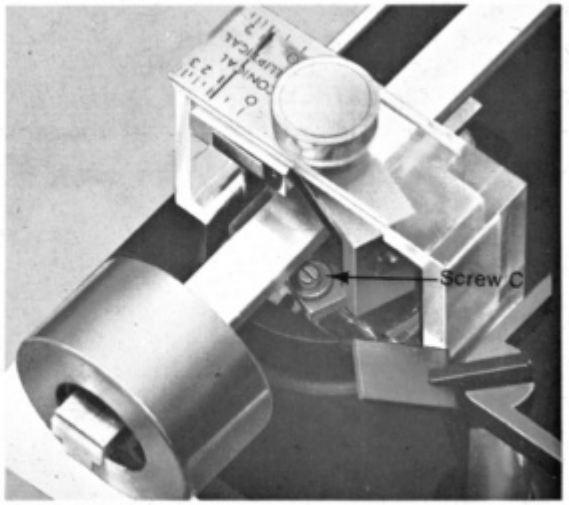


Diagram 25 Tonearm Height Restrictor

Spare parts and service

When ordering spare parts, for positive identification of your unit please quote all the information printed on the paper label underneath the unit plate or on the outside of the packing carton, also the part number if listed and the colour, or voltage and power supply frequency where appropriate.

Please address service and spares enquiries to your dealer or, in case of difficulty, to the Garrard agent in your country.

The address of the Garrard Sales Service Department in the United Kingdom is Kembrey Street, Swindon, Wiltshire SN2 6BP, England. Their telephone number is Swindon (0793) 693471.

All U.S.A. enquiries to:

PLESSEY CONSUMER PRODUCTS,
GARRARD DEALER SALES DIVISION,
100 COMMERCIAL STREET,
PLAINVIEW, NEW YORK 11803.

SELECTED SPARE PARTS LIST

Description of Part	Part Number
Automatic Record Spindle	72340
Single Record Spindle	75196
Large Centre Hole Record Adaptor	72698
Tonearm Counterbalance Weight	75138
Slide-in Cartridge Carrier, Type C.3	75149
Kit of parts to fix Pickup Cartridge	59048/091
Setting Gauge for Cartridge	75291
Platter Retaining Clip	43857
Platter complete with Mat (state power supply frequency)	75190
Stroboscope Ring for Platter (60Hz)	75191
Stroboscope Ring for Platter (50Hz)	75445
Intermediate Wheel	75625
Damping Pad for mounting spring	71084
Synchronous Motor (state voltage)	60810
Motor Pulley (60Hz) with Extractor	60902
Motor Pulley (50Hz) with Extractor	60903
Neon Lamp	75327
Transit Screw (2 per set)	44350
Clip for transit screw (2 per set)	43855

FITTING A NEW MOTOR PULLEY

The motor pulley fits closely on the motor spindle to maintain perfectly true running. If the pulley cannot be lifted off without undue difficulty after both fixing screws have been slackened, insert a 4 B.A. screw in the top of the pulley to act as an extractor and turn it with a screwdriver, while holding the pulley stationary, until it is driven off the spindle. A suitable extractor is provided with the new pulley.

The new pulley should be fitted using moderate pressure to make certain that it is pressed onto the motor spindle as far as it will go. If difficulty is experienced due to the close fit, apply a gentle heat to the base of the pulley for a short time with a clean soldering iron, in order to expand the pulley sufficiently to facilitate fitting.

Note that, if a new pulley has to be fitted as a result of a change of power supply frequency then a stroboscopic platter ring for the new frequency must be fitted at the same time.

Take great care in handling the new stroboscopic ring so that it does not bend. As it is held in position by impact adhesive (exposed when protective backing removed) make sure that the new ring is aligned exactly over the old one before pressing it permanently into position.

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Garrard
A Plessey Quality Product

These models have a high (220/240V) and low (110/125V) voltage range motor. The 'AC POWER SUPPLY AND GROUND CONNECTIONS' section on page 5 should be disregarded and the following instructions carried out instead.

AC POWER SUPPLY AND EARTH CONNECTIONS

1 Remove nut fixing the clear plastic cover from voltage changeover block on underside of unit.

2 Check that both wire links are firmly pressed onto the correct studs for the power supply voltage. See diagram 25.

3 Attach a length of 3-wire flex from a 3-pin power supply plug, or from a power outlet and earth connection on the amplifier, in the following way

(a) Brown wire to terminal screw L (live) on the changeover block.
(b) Blue wire to terminal screw N (neutral) on the block.
(c) Green/yellow wire between washers on earth terminal screw on unit plate.

Always make sure that the power supply is switched off or disconnected when making wiring connections.

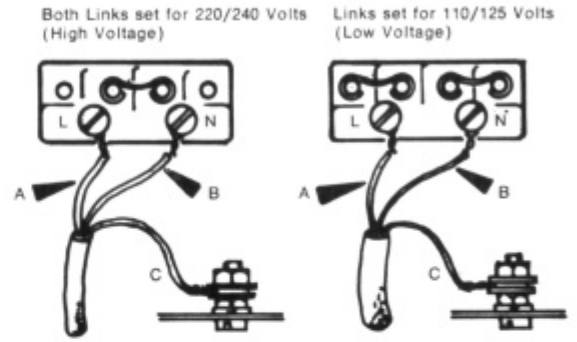

Diagram 25

CONNECTING THE CARTRIDGE TO AN AMPLIFIER

If phono leads (supplied as optional extras) are to be used, follow the connecting instructions on page 5.
Alternatively, either single- or twin-core screened pickup lead(s) can be soldered to the same 4 tags on the back of the phono socket as the leads from the pickup arm (tonearm). The leads are colour-coded thus

Red	—	Right-hand channel
Green	—	Right-hand channel 'earthy' connection
White	—	Left-hand channel
Blue	—	Left-hand channel 'earthy' connection

Connect the lead(s) to the input sockets ot the amplifier as instructed by its manufacturer.

For a mono cartridge use the right-hand channel connections only.

For a stereo cartridge used with a mono amplifier, solder one short-circuiting wire link between the same tags on the phono socket as the red and white leads and another between the same tags as the green and blue leads from the pickup arm. This will parallel both channels, either of which should be connected to the amplifier input socket.

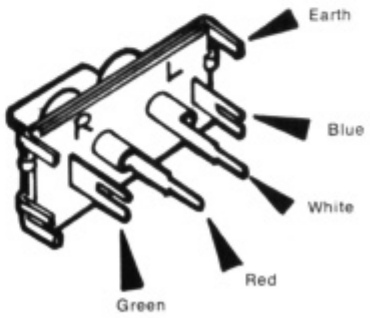

Diagram 26